Section Four:
Improving the System – Service Strategies

King County Metro provides an array of services to meet the many different travel needs of passengers, and supports the varying land uses throughout the county. All-day, limited stop express services operated by Metro and Sound Transit are supplemented by Metro's additional express service during peak periods, local services to and between activity centers, vanpools and ridesharing for trips that are less convenient by bus and *Access* service for citizens that are ADA eligible.

The backbone of Metro Transit service is a network of high ridership "core service connections;" transit routes with frequent, two-way, all-day service that connect concentrations of activity throughout King County. Local routes support the core network by extending transit coverage to residential areas, connecting more areas to transit hubs and activity centers. Peak-only routes, which include many express services, provide additional speed and capacity to expand the county's transportation options during commute periods. These services, along with vanpool, rideshare and *Access* paratransit, are designed to meet a variety of user needs that are the focus of service strategies within this section.

Planned improvements to Metro Transit service over the next ten years were funded by voter approval of the *Transit Now* initiative in November 2006. Service improvements are a core component of the *Transit Now* plan, which will increase the frequency and span of service on many core service corridors, implement five RapidRide bus rapid transit routes, and provide new service in developing areas. *Transit Now* also initiates a service partnership program that provides public and private partners an opportunity to improve specific services by contributing a portion of the cost, either financially or through speed and reliability investments that improve service and reduce costs.

The following fifteen service strategies describe how King County Metro plans to address the many public transportation service needs within King County. While these strategies describe discrete actions, in practice King County Metro attempts to advance multiple strategies whenever a service change is proposed. The process King County Metro uses to implement service and capital improvements is described in Section 6.

Strategy S-1: Service Consolidation

Pursue efficiencies in existing services in major transit corridors including, but not limited to, those listed in Exhibit 4-1. Reinvest savings from these efforts within the planning subarea in which they are generated.

Reducing or eliminating poorly performing routes can free up service hours to improve more productive routes and address unmet service needs. And by consolidating services on parallel routes into a single route, it is often possible to create corridor service that is more frequent, productive and reliable. Service consolidation describes the continual improvement to service that results from using each service change as an opportunity to shift resources to stronger routes and more productive uses.

Recent experience implementing the service consolidation strategy points to principles that contribute to successful consolidations. First, the main segments of routes must be as direct and frequent as practical. Frequent service mitigates the inconvenience of transferring by minimizing wait time and facilitating convenient connections to other markets. Secondly, sufficient capacity must be provided on the main segment of routes so those riders can avoid having to stand for extended periods. And, finally, trips should be more evenly spaced throughout the day as is the case with a headway-based system rather than the "work start-quit time" system that was historically used by King County Metro. The earlier system had emphasized the arrival and departure times at major centers at presumed shift change times.

A recent example of a successful service consolidation was demonstrated in the Ambaum-Delridge corridor, where a restructure of core service provided higher frequency service in the corridor. Other service in the area was also restructured and connections between bus routes were improved through higher frequencies. The higher frequency service achieved through consolidation resulted in increased ridership and more efficient operations. Following the restructure, ridership along the Ambaum-Delridge corridor increased by over 40 percent on weekdays and the overall ridership in the area increased by 8 percent, notably higher than the system ridership growth of 2-3 percent for the same period.

King County Metro will continue to consider service consolidations for areas where there is a positive impact on service efficiency and transit ridership. The service consolidation strategy is considered for all Metro Transit service changes. Exhibit 4-1 summarizes key corridors for consolidation.

Exhibit 4-1
Major Consolidation Corridors

Corridor	Corridor	Corridor
Northgate to Seattle CBD via I-5	Twin Lakes - Seattle CBD via SE. 320th St/I-5	Lake City - U. District via Lake City Way/25th Ave NE.
SR-522	NE 45th St	Broadway Avenue E
Rainier Ave. S	SR-520	Roosevelt Way NE
Ambaum Blvd. SW	Delridge Ave. SW	West Seattle Bridge
California Ave. SW		

Strategy S-2: Service Design

Improve transit on-time performance through: adjustments in routing, splitting of unreliable through-route pairs, adding of recovery time between trips, moving routes between operating bases, and adding time or trips to schedules to account for slower travel speeds or recurring overloads.

Schedule maintenance hours shall be reserved in amounts equal to one-third of new service investments up to 0.5% of total annual service hours with the remaining two-thirds of new service hours allocated according to Strategy IM-3. The schedule maintenance hour allocation shall be achieved in accordance with the timetable established in Strategy IM-3 without regard to subareas. Schedule maintenance hours that are not used for schedule maintenance in each year shall be used for new service. To the extent that schedule maintenance requirements exceed the service hours available under this policy, reduction of existing services within the same subarea will be used to fund schedule maintenance needs.

In the event that schedule maintenance hours are proposed at a level exceeding 0.5% of total annual service hours by the Department of Transportation, the Regional Transit Committee shall review this proposal and recommend any change in allocation policy to the Metropolitan King County Council.

This strategy addresses the role of route design and planning in improving service reliability. The capital elements of transit speed and reliability are addressed in Strategy C-3. Many factors impact service reliability including traffic congestion and changes in ridership. As traffic and ridership change, schedules must be adjusted to maintain on-time performance, and sometimes routes must be changed to maintain or restore reliable service.

Transit operates in increasingly congested traffic conditions throughout King County, especially in the urban centers, on freeways approaching urban centers, and on arterial roads approaching freeway interchanges. Traffic congestion slows transit and does so in an irregular manner that causes trip times to vary – so schedules need constant adjusting. Poor on-time performance discourages transit ridership by increasing the risk that trips will take longer to complete, that connecting transfers will not be made, or that a scheduled bus will not arrive on time or at all. Riders respond to this risk by catching earlier trips, increasing overall trip time, or by reducing their use of transit.

When traffic congestion delays a specific service on an ongoing basis, schedule maintenance resources may be added to the route. Time is added in between bus trips in work assignment to ensure that each bus begins its next trip at the scheduled time. At any given time, traffic congestion affects many routes in the system, and these resources are added where and when they are needed most. These adjustments provide increased reliability for riders on currently scheduled service.

Route design also impacts service reliability. Longer routes have a greater cumulative exposure to traffic incidents, wheelchair lift deployments, and other sources of intermittent delay that become more severe as traffic worsens. Unreliable service also tends to be unevenly loaded, since a bus that is delayed starts to pick up passengers who were intending to take the following bus, while the following bus now has a lighter load causing it to operate ahead of schedule. When this occurs, buses bunch together, decreasing the effective frequency of the service.

Bus trips that enter downtown Seattle as one route and leave as another (known as "through-routing") are especially susceptible to reliability problems, because the combined trip covering two routes can be very long. Many downtown-oriented all-day routes are through-routed, and the practice does also have advantages, it: reduces operating costs, uses fewer buses to provide the same amount of service, distributes passenger loads from both routes throughout the central business district, and it provides

one trip access for riders to go from one side of the city to the other. Through-routing also reduces downtown bus volumes and the need for layover space in downtown areas where curbspace is difficult to obtain. Most trolley routes and many diesel routes operate this way. This practice works well as long as traffic congestion does not unduly delay service. But as traffic congestion worsens, through-routes become more difficult to operate reliably.

Schedule reliability is an important factor in the quality of transit service. The implementation of *Transit Now* will provide an increase in schedule maintenance hours, providing expanded resources for King County Metro to improve service reliability. These resources will be used to adjust schedules as congestion or overloads makes trip times longer, and to redesign routes when they can no longer operate reliably.

Strategy S-3: Core Service Connections

> **Improve service levels on existing routes and create new routes serving established urban and manufacturing/industrial centers and urban areas where, because of population or employment clusters, ridership and transit use is projected to be the highest. Improve frequencies as listed in Exhibit 4-2 and shown in Exhibit 4-4 to support existing demand and attract more riders on a core network of key connections. Improvements in core services will be made consistent with the *Transit Now* program.**

The largest service investment in *Transit Now* in this strategic plan is dedicated to improvements to the high ridership core service connections. Core routes are primary two-way, all-day connections between activity centers throughout the county. Because core routes have transit attractions at both ends, they are productive in both directions. Core routes are strengthened by the service consolidation strategy, which aims to consolidate parallel routes to develop a stronger and more frequent all-day connection. By providing service to and between the county's activity centers, the core connection network advances the land use and transportation objectives of local and regional comprehensive plans.

Transit Now high ridership core service investments target routes serving and connecting urban and manufacturing centers. Service improvements include added trips, frequency upgrades and expanded hours of operation. When service is frequent, it is more likely to be available when customers need it and reduces wait time between buses for riders who transfer. When service becomes very frequent, some riders will find they can use it spontaneously, without having to consult a timetable.

Service frequency is an important factor in ridership levels. National research on travel behavior suggests that, in decision-making regarding whether to use the bus, time spent waiting for the bus is twice as important as time spent getting to or riding the bus[10]. Ridership levels are typically more responsive to changes in service frequency[11]. The target frequency for service on routes selected for *Transit Now* investment is every 15 minutes, seven days a week. Improvements funded by *Transit Now* are shown in Exhibit 4-2, and illustrated in Exhibit 4-4. All other core corridors are listed in Exhibit 4-3 and shown in Exhibit 4-5.

King County Metro investments in core service routes support land use and growth management objectives by focusing transit service improvements on routes that serve transit and pedestrian-friendly activity centers. Improved transit service levels can also promote complementary actions by local jurisdictions and private developers to make transit service more attractive and effective, and to make improvements to pedestrian access and walkability. Local jurisdictions can improve transit by promoting density near transit lines, by providing queue jumps or transit signal priority at intersections to improve the speed and reliability of service, or by improving the pedestrian environment that help transit users get to and from their bus stop. Local jurisdictions and employers can make transit more effective through commute trip reduction programs and by managing the supply of parking. By identifying corridors where transit improvements will occur, local jurisdictions can adopt comprehensive plans that will focus development and improvements in places that will complement and support planned transit services.

[10] Patrick Mayworm, Armando Lago, and J. Matthew McEnroe. *Patronage Impacts of Changes in Transit Fares and Services.* Urban Mass Transportation Administration, Washington D.C., 1980.

[11] John E. Evans *Traveler Response to Transportation System Changes*. Transportation Research Board, 2004.

Exhibit 4-2

Transit Now Investments for Core Service Routes

Between		Corridor	2016 Target Frequency		
			Peak	Midday & Sat	Eve & Sun
Level 3 Improvements (More than 15,000 annual hours): Major weekday frequency upgrades, new bus routes and/or route extensions					
Auburn	Kent	Auburn Way	30	30	30
Bellevue	Eastgate/BCC	Lake Hills Connector, 148th Av SE	10-15	15	30
Bellevue	University District	SR-520	10-15	15	30
Des Moines	Downtown Seattle	1st Ave S, SR-509, E Marginal Way	30	60	60
Issaquah	Bellevue	I-90, BCC	30	30	60
Issaquah	Redmond	228th Av SE, NE Sammamish	30	30-60	60
Kent	GRCC	E James St, 124th Av SE	30	30	60
Kent	Burien	KDM rd., S 240th St, 1st Av S	30	30	60
Kent	Four Corners	SE Kent Kangley Rd	30	30	60
Kent	Renton	Smith St., Benson Rd, Carr Rd	15	15-30	30-60
Kent	SeaTac	Orillia Rd, S 212th St	30	30	30
Kirkland	Eastgate/Factoria	156th Ave, Overlake, Crossroads Mall, BCC, Eastgate	15	15	30
Kirkland	Redmond	Avondale Rd NE, NE 85th St	30	30	30
Queen Anne	Downtown Seattle	Queen Anne Ave N	5-7	10-15	30
Renton	Burien	SW Grady Way, S 154th St	15	15	30
Level 2 Improvements (5,000 - 15,000 annual hours): Minor weekday frequency upgrades, expanded weekday hours of operations and/or added weekend service.					
Ballard	University District	NW Market St, N and NE 45th St	10	15	15-30
Beacon Hill	Downtown Seattle	Othello/New Holly Station, Beacon Av S	5-7	10-15	15-30
Bellevue	Bear Creek	Overlake	15	15-60	60
Bellevue	Kenmore	Finn Hill, Juanita, Kirkland, South Kirkland P&R	30	30	60
Bellevue	Renton	Coal Creek Pkwy, Factoria, Newcastle	15	30	30
Capitol Hill	Seattle Center	Denny Way	15	15	30
Kirkland	Bellevue	Lake Washington Blvd NE, Bellevue Way NE	15	30	60
Redmond	Eastgate/Factoria	148th Ave, Crossroads Mall, BCC, Eastgate	15	15	30
Renton	Downtown Seattle	MLK JR Way S, I-5	5-10	15-30	30
Redmond	Eastgate/Factoria	148th Ave, Crossroads Mall, BCC, Eastgate	15	15	30
University District	Downtown Seattle	Eastlake Ave E, Fairview Av N	12	15	15-20
Level 1 Improvements (5,000 annual hours or less): Added trips, expanded hours of operation and/or weekend frequency upgrades					
Auburn/GRCC	Federal Way	15th St SW, Lea Hill Rd	30	30	30
Burien	Downtown Seattle	Ambaum Blvd SW, Delridge Way SW	7-10	15	30
Kenmore	Shoreline	Ballinger Way, Aurora Village	15-30	30	60
Kent	Downtown Seattle	W Valley Hwy, Southcenter Blvd, Interurban Ave S, I-5	15	15	30
Kirkland	Downtown Seattle	108th Ave NE, SR-520	15	30	30-60
Northgate	Downtown Seattle	I-5	4-15	15	30

Exhibit 4-3
Other Core Service Corridors

Between		Corridor	2016 Target Frequency		
			Peak	Midday & Sat	Eve & Sun
Other Core Corridors served by Metro Transit					
Admiral	White Center	California Ave SW	30	30	30
Aurora Village	Downtown Seattle	Aurora Ave N	10	15	30
Ballard	Northgate	24th Ave NW, Holman Road	30	30	60
Ballard	Downtown Seattle	15th Ave NW	10	10	30
Bellevue	Factoria	112th Ave NE, South Bellevue P&R	30	30	60
Bellevue	Redmond	Crossroads, Overlake	15	15	30
Capitol Hill	Downtown Seattle	15th Ave E, Pine St.	10	15	30
Capitol Hill	Downtown Seattle	Broadway E, Pine St.	10	10	15-30
Capitol Hill	Downtown Seattle	Madison St.	10	15	30
Central Area	Seattle CBD	Jefferson-James	7-8	10	15
Federal Way	Downtown Seattle	I-5	30	30	30
Federal Way	SeaTac	SR-99	20	30	30
Fremont	Downtown Seattle	Dexter Ave N	10-15	15	30
Greenwood	Downtown Seattle	Greenwood Ave N	15	15	30
Kirkland	Totem Lake	124th Ave NE, Kingsgate P&R	30	30	60
Loyal Heights	University District	NW 85th St, 15th Ave NE	10	15	30
Madrona	Downtown Seattle	Union St	15	15	30
Northgate	Downtown Seattle	Wallingford Ave N, Aurora Ave N	20	20	30
Northgate	University District	Roosevelt Way NE, 5th Ave NE	10-15	15	30
Queen Anne	Downtown Seattle	5th Ave N, Taylor Ave N	10-15	20	15-30
Rainier Beach	Downtown Seattle	Rainier Ave S	10	10	15-30
Sea-Tac Airport	Downtown Seattle	I-5	15-30	15	30
University District	Downtown Seattle	Pine St. 23rd Ave NE	10-15	15	30
University District	Downtown Seattle	I-5	5-8	7-10	--
University District	Columbia City	23rd Ave NE, MLK Jr Way S	10	15	30
University District	Woodinville	SR-522, Bothell	30	60	---
West Seattle	Downtown Seattle	Fauntleroy Ave SW, W. Seattle Bridge	15	15	30
White Center	Southcenter	Military Rd, S 144th St	30	30	30
Core Service Connections in King County served by Sound Transit					
Redmond	Kirkland	NE 85th St	30	30	60
Bellevue	Downtown Seattle	I-90, Bellevue Way NE	5-8	15	30
Issaquah	Downtown Seattle	I-90	30	30	60
Bothell	Bellevue	I-405	15	30	30
Lynnwood	Bellevue	I-405	15	30	60
Bellevue	Sea-Tac	Renton, I-405	30	30	30
Bellevue	Auburn	Renton, Kent	15	30	60
Redmond	Downtown Seattle	SR-520	10-15	30	30
Woodinville	Downtown Seattle	SR-522, I-5	30	30	30
Federal Way	Sea-Tac	I-5	15	--	--